

*Subt A1*

**What is claimed is:**

- A method for removing smear layer from a prepared tooth surface comprising irrigating the surface with a sterile solution comprising:  
disinfectant;  
detergent; and  
organic acid.
- The method of claim 1 wherein the disinfectant is an antibiotic.
- The method of claim 2 wherein the antibiotic is substantially stable in acidic solution.
- The method of claim 3 wherein the antibiotic is a tetracycline.
- The method of claim 4 wherein the antibiotic is doxycycline.
- The method of claim 1 wherein the detergent is a Food and Drug Administration-approved additive.
- The method of claim 6 wherein the detergent is a sorbitan ester.
- The method of claim 6 wherein the detergent is a polysorbate.
- The method of claim 8 wherein the detergent is polyoxyethylene sorbitan monooleate.
- The method of claim 1 wherein the organic acid has a pKa between 1.5 and 5.
- The method of claim 1 wherein the organic acid has a pKa between 2 and 5.
- The method of claim 1 wherein the organic acid has a pKa between 2.75 and 3.75.
- The method of claim 12 wherein the organic acid is citric acid.
- The method of claim 1 wherein the surface is an endodontic situs.
- The method of claim 1 wherein the surface is an excavated root canal.
- The method of claim 1 wherein the surface is a surface prepared for a periodontic procedure.
- The method of claim 1 wherein the surface is a prepared site for tooth restoration.
- The method of claim 1 wherein the surface has been prepared for reconstruction of a tooth.
- The method of claim 1 wherein the tooth surface is irrigated for between 1 minute and 1 hour.

20. The method of claim 1 wherein the tooth surface is irrigated for from about 1 to 30 minutes.
21. The method of claim 1 wherein the tooth surface is irrigated for from about 1 to 10 minutes.
22. The method of claim 1 wherein the disinfectant is present in an amount of from about 1 to 5 percent by weight of the solution.
23. The method of claim 1 wherein the disinfectant is present in an amount of from about 2 to 4 percent by weight of the solution.
24. The method of claim 1 wherein the disinfectant is present in an amount of about 3 percent by weight of the solution.
25. The method of claim 1 wherein the detergent is present in an amount of from about 0.1 to 1.5 percent by weight of the solution.
26. The method of claim 1 wherein the detergent is present in an amount of from about 0.25 to 1 percent by weight of the solution.
27. The method of claim 1 wherein the detergent is present in an amount of about 0.5 percent by weight of the solution.
28. The method of claim 1 wherein the acid is present in an amount of from about 0.5 to 10 percent by weight of the solution.
29. The method of claim 1 wherein the acid is present in an amount of from about 3 to 6 percent by weight of the solution.
30. The method of claim 1 wherein the acid is present in an amount of from about 4 to 5 percent by weight of the solution.
31. The method of claim 1, wherein the composition of the solution is about 3% disinfectant, 0.5% detergent, and 4.25% acid by weight.
32. The method of claim 1 wherein the solution comprises doxycycline, polysorbate 80, and citric acid.
33. The method of claim 1, wherein the composition of the solution is about 3% doxycycline, about 0.5% polysorbate 80, and about 4.25% citric acid by weight.
34. A sterile solution for removing the smear layer on a prepared surface comprising:  
disinfectant;  
detergent; and  
organic acid.

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35. The solution of claim 34 wherein the disinfectant is an antibiotic.
36. The solution of claim 35 wherein the antibiotic is substantially stable in acidic solution.
37. The solution of claim 36 wherein the antibiotic is a tetracycline.
38. The solution of claim 37 wherein the antibiotic is doxycycline.
39. The solution of claim 34 wherein the detergent is a Food and Drug Administration-approved additive.
40. The solution of claim 39 wherein the detergent is a sorbitan ester compound.
41. The solution of claim 40 wherein the detergent is a polysorbate compound.
42. The solution of claim 41 wherein the polysorbate compound is polysorbate 80.
43. The solution of claim 34 wherein the organic acid has a pKa between 1.5 and 5.
44. The solution of claim 43 wherein the organic acid has a pKa between 2 and 5.
45. The solution of claim 44 wherein the organic acid has a pKa between 2.75 and 3.75.
46. The solution of claim 45 wherein the organic acid is citric acid.
47. The solution of claim 34 wherein the disinfectant is present in an amount of from about 1 to 5 percent by weight of the solution.
48. The solution of claim 34 wherein the disinfectant is present in an amount of from about 2 to 4 percent by weight of the solution.
49. The solution of claim 34 wherein the disinfectant is present in an amount of about 3 percent by weight of the solution.
50. The solution of claim 34 wherein the detergent is present in an amount of from about 0.1 to 1.5 percent by weight of the solution.
51. The solution of claim 34 wherein the detergent is present in an amount of from about 0.25 to 1 percent by weight of the solution.
52. The solution of claim 34 wherein the detergent is present in an amount of about 0.5 percent by weight of the solution.
53. The solution of claim 34 wherein the acid is present in an amount of from about 0.5 to 10 percent by weight of the solution.
54. The solution of claim 34 wherein the acid is present in an amount of from about 3 to 6 percent by weight of the solution.
55. The solution of claim 34 wherein the acid is present in an amount of from about 4 to 5 percent by weight of the solution.

56. The solution of claim 34 wherein the composition of the solution is about 3% disinfectant, 0.5% detergent, and 4.25% acid by weight.
57. The solution of claim 34 wherein the solution comprises doxycycline, polysorbate 80, and citric acid.
58. The solution of claim 57 wherein the composition of the solution is about 3% doxycycline, about 0.5% polysorbate 80, and about 4.25% citric acid by weight.
59. A method for removing smear layer from a prepared bone surface comprising irrigating the surface with a sterile solution comprising:  
disinfectant;  
detergent; and  
organic acid.

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